IMPLEMENTATION OF THE BIBLIOTECH LIBRARY SOFTWARE SYSTEM AT RAYTHEON COMPANY

Vicary Maxant*

ABSTRACT

The Research Division Library is the first Raytheon Library to implement a fully-integrated online information system. The BiblioTech library software system, developed specifically for special libraries, runs on the division's VAX 8200. The author discusses the features and benefits of BiblioTech and the implementation of its various functions. Since Research Division Library is the only library currently using barcodes with BiblioTech, she discusses the advantages of using barcode technology for circulation control.

BACKGROUND

Two circumstances set the stage, in 1984, for automating Raytheon's Research Division the library. First, Research Division was preparing to purchase its first minicomputer. Up until this point, the division staff had had to connect, via modems and telephone lines, to the computers in the Raytheon Scientific Computer Center 7 miles away. Management had decided that the time had come to install a computer to ease the burden of some of the administrative tasks, such as word processing, purchasing and library functions. Second, the person selected to research the features and benefits of various types of computers was the head librarian. After the selection and installation of a Digital VAX 11/750, she was appointed manager of the new computer support

* Head Librarian, Research Division, Raytheon Company, Lexington, Massachusetts, U.S.A.
group, whose job was to oversee the installation of the VAX and the implementation of the first local computing capabilities within Research Division.

SELECTION PROCESS

We began the selection process in late 1984. The one restriction in our investigations was that the software had to run on the VAX. We were able, at that time, to identify 9 packages that fit the hardware requirement, and 3 products that had been designed specifically for the needs of a special library such as ours. We looked for, and compared, the following factors:

- Integrated modules — a single database with changes to one module dynamically updating all files.
- Online catalog capability to allow all employees to access the catalog from their offices.
- Authority control to maintain the integrity of the catalog.
- Circulation control and periodical control to eliminate our labor-intensive manual systems.
- User friendliness.
- Customer support by the vendor (very important in our environment, which has only a small in-house support group).
- Maintenance and enhancements to prevent obsolescence.
- Documentation that is well-written, accurate and easy to use.
- Turnkey software needing little tailoring.
- Passwording.
- Ease of input.
- Vendor responsiveness during our investigations.

After months of research, we selected BiblioTech, vended by Comstow Information Services of Stow, Massachusetts. While we liked the searching features of one of the other products, we did not have the programming staff to do the customizing that it
required, and at that time, BiblioTech was the only package that had the periodical check-in module that we so badly needed. In addition, BiblioTech offered the most function for dollars spent.

DESCRIPTION OF THE BIBLIOTECH SYSTEM

BiblioTech is a fully integrated library software system that is an online catalog tied in with the following library housekeeping functions: circulation control, borrower maintenance, accounting, catalog maintenance (data entry), authority maintenance, periodical check-in, and periodical routing. The modules interact cooperatively using a single data base. Data entered in any one of the modules dynamically updates the appropriate files in the other modules. BiblioTech operates on DRS, a fourth generation data base management system, which is an integral part of the software and does not have to be purchased separately.

Research Division purchased all of the modules with the exception of accounting, which supports all acquisitions functions from ordering through receiving and payment. Since all of the paperwork involved in these functions is performed for the library by the division’s purchasing office, we would not have fully utilized this module (and we did not want the purchasing office to give these bookkeeping functions back to us). We are, however, planning to purchase the OCLC interface, a module that converts data from OCLC cataloging format to BiblioTech format, and the thesaurus module, and enhancement to the authority. Both functions will be available in 1988.

KEY FEATURES OF BIBLIOTECH

The catalog searching module allows the user to search using Boolean logic, the DRS command language, or a menu-driven search that allows access by a choice of 13 keys including: compu-
Implementation of the Bibliotech Library Software System
at Raytheon Company

ter ID number, personal names, corporate names, titles, any word in a title, subject headings, any word in a subject heading, series titles, any word in a series title, report numbers, call numbers, international standard book numbers and international standard serials numbers.

The circulation modules allows loans, returns, renewals and holds (reserves). Borrower maintenance, a subset of this module permits additions, deletions, and modifications of borrower records, as well as scanning of borrowers by name or borrower ID. When holds are processed in the circulation module, the system prints a routing label for the reserved item. Barcode labels may be used with this module for efficient and accurate circulation control.

The accounting module tracks funding and financial transactions involved in the acquisitions process. It maintains vendor, address and cost center records, and tracks activity for specific copies, line items and purchase orders. It also provides summaries of activity for individual accounts and vendors, and provides customized reports.

The catalog maintenance module allows the library to enter title and copy records into the database and to modify or delete these records. Data entry is done in real time, with all inverted indexes being updated at the time of data entry. BiblioTech has screen forms for books, periodicals, document/reports, journal articles and book analytics. An optional rapid data entry system is a package that may be used to maximize typists' speed and to key in large volumes of data quickly.

The authority performs automatic verification of corporate names and each subject heading. The system checks each corporate name and subject headings against a controlled vocabulary of permissible terms which has been created by the individual library. Terms may be added, deleted or globally modified. If a non-standard term is entered, one keystroke will allow the data entry clerk to scan the authority for the proper term, or to use the new term. A personal name authority, currently under development, will be available in the near future.
The *periodical check-in* module tracks subscription and arrival pattern data for each journal title. It predicts the date, issue, volume and total number of copies of each title, and permits online check-in of multiple copies. It creates claim reports for issues that are overdue beyond the grace period (which is determined for each title by the library). Special routing or handling information may be displayed on the check-in screen. At the time of check-in, BiblioTech creates appropriate routing lists for each copy. The *periodical routing* function, a feature of this module, is used to add, delete or modify routing lists.

The BiblioTech package includes 21 pre-formatted standard reporting capabilities, including routing slips, borrower report, shelf list, corporate name index, personal name index, title index, report number index, spine labels, catalog cards, order forms, overdue notices, borrowed items report, new acquisitions lists, subject heading index, series title index, labels for hold items, claiming reports, and accessions number list. In addition, Comstow will create custom reports, or provide training to the customer who wishes to create his own.

Basic BiblioTech, the minimum required package, consists of the catalog maintenance, authority and catalog searching modules. Other modules can be added at a latter date. The vendor provides single- and multi-user versions.

The purchase price of BiblioTech includes basic and advanced users' manuals, as well as the installation and maintenance guide. The documentation is well-written, complete and generally easy to use. Training includes basic and advanced sessions, with the initial session given at the time that the library begins data entry and advanced training when the library goes online with one or more operations. Specialized courses, such as report writing, are also available.

Other features of BiblioTech include regular revisions to the software and a users' group. At the annual users' group meeting, the Comstow solicits suggestions from its customers regarding enhancements and improvements to the product. These sugges-
tions are prioritized by each customer and enhancements in most demand are included in a subsequent update. Customers and vendor both actively contribute to the users' group, sharing information and new ways to use BiblioTech.

Customers with problems or questions can call the BiblioTech hotline. A staff of librarians, programmers and computer specialists will answer procedural, technical, or software-related questions.

IMPLEMENTATION OF BIBLIOTECH AT RESEARCH DIVISION

Even before the BiblioTech software was installed, we took a number of preparatory steps. Two college students who worked in the library during the summer vacation did an inventory of the book collection, the first in about 12 years. Working from our shelf list and circulation cards, they identified books that were apparently lost. One student, a computer science major, created a file of essential employee information on the VAX. He then wrote a program that would reformat the information and dump it into BiblioTech borrower records.

Meanwhile, I visited a local BiblioTech installation and learned everything I could about BiblioTech records. The librarian showed me on a field-by-field basis the length of fields, the purpose of each one, and what the output looked like. She also shared her library's data-entry standards with me. After spending several days with her, I had the basis of the Research Division data entry standards for books, which we published on a word processing program on the VAX. I compared her information to the recommendations in the BiblioTech documentation, and to the standards of another local library, and tailored the information to suit our needs.

We also investigated the use of barcodes as the unique identifying number for each book. The BiblioTech book record contains essentially the same information as a paper catalog card.
This title record is identified by a system-assigned number called
a computer identification number (CID), which may have one or
many copies attached to it. The unique identifying number for
each copy is called an accession number. Even though we had
been assigning accession numbers to books since the library open-
ed in 1952, we decided to abandon the old numbers in favor of
barcodes. Since the only function of our accession numbers was
to provide uniqueness to a particular item, assigning new numbers
had no consequences. Our old system no longer provided us with
any accurate count of our holdings, since it did not reflect books
lost or discarded in the last 30 years. Indeed, by starting over with
barcode labels, we obtained an accurate count of our holdings, and
found actually had fewer books than we thought.

Installation and training took place at the end of July, 1985.
The college students were set up with terminals close to the book
stacks. We started data entry with new books and with the re-
ference collection, since it had a limited number of books, and was
a good test collection for our inputting standards. It also contained
variety of types of materials—monographs, series, numbered series—
that forced us to clarify some of our rules. We decided, for ex-
ample, to list series titles only for numbered series, and to make
separate records for reference and circulating copies of the same
title (so that a user browsing the online catalog could immediately
see that one was REFERENCE and one CIRCULATING without
having to look at copy records). For several weeks, we entered
records, browsed them in the online catalog, printed them in
reports in various formats to see the results of our decisions. We
proofread our entries as we went along, and by the time we had
finished the reference collection, we had the final revision of our
inputting standards. With training complete, and our inputting
standards finalized, the data entry personnel found that they
could enter 50 to 75 title records (with copy records attached) per
hour. After completing the reference collection, we started on the
books on the shelves in the circulating collection. At the same
time, we entered returned books before they were put back on the
shelves.

As we received new books, we entered them into BiblioTech. Our first "product" was an list of new books, which was an efficient way to get acquisitions information to our users in a timely manner, and to show management immediate results from our project. We now produce monthly acquisitions lists for books and for new government reports. In addition, we produce a semi-monthly list of new journal articles on superconductivity, one of our current "hot topics". Using the standard citation report format, we create lists of new items in each category, print them on a laser printer, reproduce the lists on library letterhead, and mail them to our users. These lists have a finished, professional appearance and can be produced in considerably less time than it took to type them manually.

Since Research Division does not have a circulation period, and many of our materials had been out on loan for many years, we faced the problem of retrieving them from offices, barcoding them, creating records, and returning them to our users. Our first step was to send a memo to all library users explaining BiblioTech and the need to retrieve books for barcoding and suggesting that they return any library materials that they no longer needed. At the time that we retrieved books from offices, there were two college students working full time in the library. Working as a team, they would notify patrons several days in advance of the day when they would retrieve his books for barcoding and data entry, including a list of books in his possession. The students would retrieve only as many books as they could enter in a day, usually 40 books per hour, with pick-up and delivery service.

Implementing the periodicals control module was high on our list of priorities, since in the previous year an unfortunate error on the part of our periodicals jobber had sent more than 25% of our subscriptions to the wrong address! Since many of our titles are irregulars or quarterlies or foreign titles that may be delayed, it took several months for us to realize that we had more than just a few renewal problems. (It took over a year to replace
the issues of these misdirected titles.) BiblioTech allows a library to build in a grace period for each title, after which it creates a claim report of missing issues, thus identifying problems at a much earlier stage. Loading periodical titles was a time consuming since we also used this time to deal with missing issues, title changes and collection policies. As with the books, we created a written set of data entry standards, which we revised and refined as we entered data, and experimented with the results.

We now check-in our periodicals online with a few keystrokes. BiblioTech creates routing lists for each routed copy as it is checked in. At the end of the check-in session, we simply print the lists and attach them to each item. Since routing lists are easily created, modified and manipulated, we no longer have to deal with handwriting lists or with retyping master lists every time a patron is added or deleted. BiblioTech also allows us to put on the check-in screen a list of patrons wanting a copy of the table-of-contents, thus eliminating another old manual file.

The Research Division Library is also responsible for collecting and archiving the hundreds of technical reports, proposals, and periodic contract reports written each year by the division's scientific staff. Unfortunately, the system for collecting them had been somewhat haphazard in the past. Using the document/report format, we created a set of data-entry standards for our company reports and entered every one that was on the library shelves. We found that searching the catalog by report number was invaluable, because it allowed us to list numbers we had, and thus make lists of what we needed to find for inputting. In addition, searching by contract number is extremely valuable in pulling together all reports on a particular contract, since the company-assigned numbers, under which they are filed, are merely sequential and have no relationship whatsoever to the contract number.

Several months ago we abandoned our manual circulation system and began to use the online circulation system. We waited to begin this phase until we were sure that we had retrieved and entered most of our materials. Using our old book circulation
cards, one of the students did a final check on all materials that had not yet been barcoded. She entered all of our missing materials with a minimal title record (no classification numbers, for example, so patrons and staff will not search the shelves fruitlessly) and a status of LOST. When LOST books reappear, as they occasionally do, the record is easily updated.

Research Division Library has an INTERMEC barcode reader attached to the terminal on the circulation desk. The reader, with wand and power pack is the size of a paperback book, and has proved to be accurate, reliable and easy to use. We check books in and out merely by scanning the barcode in the book with a barcode wand. While we considered using barcodes to identify employees as well, we rejected that idea in favor of using the company assigned employee number which is used in all other transactions between Raytheon and its employees. This means that we have to key, rather than scan, patron identification numbers, but this is more convenient for our users than carrying a barcoded library card. Our barcodes are high density CODE 39, vinyl with a laminated coating and permanent adhesive.

While periodicals check-in, and circulation control are library housekeeping functions that do not interact with the catalog in a manual system, they do have an important impact on our online catalog. With Bibliotech, we can browse the catalog, not only for books, but for periodicals as well. The online catalog allows subject access to periodical records, and permits patrons to see the starting date of each title, the number of copies received and the date of the most recent issue checked in. Book records interact with the circulation module to show number of copies, location (shelf, file, office, etc.), status (reference or circulating copy), and whether they are checked out or on the shelf. The patron is not allowed to see who has borrowed these copies, but a librarian can easily check the circulation module and provide this information if necessary.

Because our online catalog provides so much more function than a mere catalog of book holdings, we are making much better
use of our materials, and as a result, our users are getting more indepth service. A user looking for materials on a particular subject locates not only books, but journal articles, company reports, government reports, book analytics and titles of relevant journals. Our reports collections, formerly so difficult to access, can now be used easily by our patrons.

CONCLUSION

The BiblioTech system has been operating as an online catalog in the library for more than a year. It is used daily by the staff, and by patrons with the help of the staff. Since all Research Division employees have access to computer terminals, the next step, in the coming year, will be to open the catalog searching module for all employees to use from their offices. Eventually, we will close the card catalog. Patron reaction has been extremely positive. Not only did we receive excellent cooperation during the conversion process, but we have regular inquiries about what the new system does and how it works. Some of the recent college graduates have complained that they have never used anything but an online catalog and want to know how soon this one will be generally available!

Because of the favorable attitude toward library automation which already existed at Research Division when we began the BiblioTech project, we did not have to sell the idea to anyone, nor did we have to justify the allocation of funds. The only minor limitation has been we have not always had full time data entry staff. College students have been excellent data entry personnel since they are already familiar with libraries and computers, and they understand the importance of creating a clean database. Students at the Simmons College Graduate School of Library and Information Science have the added advantage of understanding cataloging and indexing. In the past two years, five students have worked on various stages of the project, full-time during summers
Implementation of the Bibliotech Library Software System at Raytheon Company

and vacations, and part-time during the school year. When we have no students, the regular staff can only keep up with entry of some of the new materials. By taking a cautious approach, however, and planning every step of the way, Research Division Library has had a very positive experience with the implementation of BiblioTech, and the employees of Research Division are benefiting from new and efficient services that we are able to provide with a state of the art library system.